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Joyce, T. Frank

The Boston and Maine Railroad

[Boston]

[1925]

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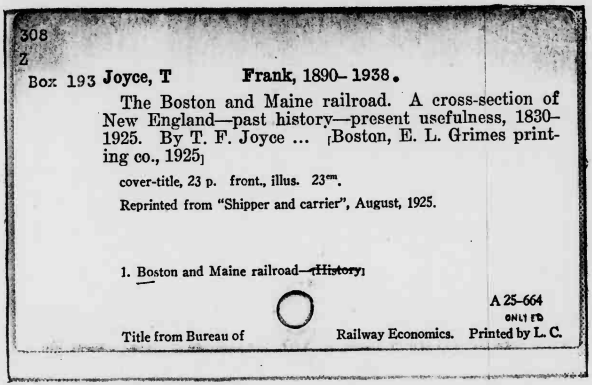
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Box 193 **Joyce, T** **Frank, 1890–1938.**

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Reprinted from "Shipper and carrier", August, 1925.

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THE BOSTON AND MAINE RAILROAD

A Cross-Section of New England

Past History—Present Usefulness

1830-1925

By T. F. JOYCE
Assistant to the President

Reprinted from
"SHIPPER AND CARRIER"
August, 1925

"TRAIN OF A HUNDRED CARS"

Boston and Maine Railroad's Fast Merchandise Freight, Which Brings to New England, Through the Hoosac Tunnel, Essential Fuel, Foodstuffs and Raw Materials, and Carries New England Products to the Markets of the Country.

The Boston and Maine Railroad

1830-1925

A Pioneer Railroad, a Busy Railroad, a Safe Railroad, a Railroad of Prompt Service—A Cross Section of New England, Geographically, Industrially, Agriculturally, Socially. How It Started; How It Grew; What It Is Today.

Republished from "Shipper and Carrier," August, 1925.

THE Boston and Maine Railroad, on March 10th, 1925, from the hands of President James H. Hustis, issued its Ninety-second Annual Report, marking the ninetieth year of its service to New England and approximately half a century of service as an important eastern terminal carrier for the rail transportation of the country.

Ninety years is a long time as railroads go, and the Boston and Maine with its constituent lines harks back to the pioneer days of steam railroading in America.

From that day in 1835 when a train of three small cars painted in vivid colors, drawn over the early fish-belly rails and sleepers of stone between Boston and Lowell by a primitive locomotive—from that day to this, when the "Train of a Hundred Cars" with big Santa Fe engines carries westward in fast merchandise freight service New England products bound for distant markets, or eastward brings essential raw materials, fuel and supplies,—the Boston and Maine lines have functioned as active and helpful factors in New England's life.

Incorporated June 8th, 1830, as the first steam railroad projected in New England and the first to start construction, the Boston and Lowell Railroad formed the original trackage of the Boston and Maine System of today. Its first train was operated on June 24, 1835, with a locomotive built by George Stephenson, who at Newcastle-on-Tyne, a few years before, had demonstrated the success of the steam locomotive.

This road became a part of the Boston and Maine by lease in 1887 and was merged with the system later.

The genesis of the Boston and Maine, however, is more directly traced by name and dominance of strain to the Andover and Wilmington Railroad, chartered in 1833 to build a seven mile branch line. Extended from time to time, this branch, which was destined to give a name to a system, reached the New Hampshire border and thence by merger pushed into Maine to take the name "Boston and Maine" which the system, expanding also in other directions, has since held.

The promoters estimated the business of this original line at 5700 tons a year, the amount conveyed between Andover and Boston in the old baggage wagons, and estimated the total number of passengers at 15,681 a year, the number of persons then carried by stage coaches.

Ranks High

The ninety-second annual report, which recorded for stockholders and for the public alike the measure of service

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performed by the Boston and Maine Railroad in 1924, announced an aggregate of 2,744,213,671 revenue ton miles, and a total of 772,430,240 passengers carried one mile. This represented a density per mile of road of 1,224,221 revenue ton miles and 344,589 passengers caried one mile, respectively.

In terms of freight, this traffic density of the Boston and Maine is comparable with that of the Union Pacific System, the Northern Pacific, the Frisco, the Southern Pacific, the Santa Fe, Rock Island and other roads.

The Boston and Maine is known the country over for its tourist and resort travel in the picturesque mountain, seashore and lake sections of northern New England as well as for its large commutation patronage. It is not so surprising, then, that it leads the roads named in passenger density as well, and leads also the Baltimore and Ohio and many others.

At Boston alone in 1924 the Boston and Maine handled through the North Station a total of 27,717,242 persons. For years this passenger terminal movement has been the largest in the country handled through a single train shed serving a single railroad, and the North Station has been ranked fourth or fifth among all the stations of the country. It reached a peak of 33,913,598 persons in 1920. The "National Geographic Magazine" only a year or so ago confirmed its premier distinction among the single-road terminals of the United States.

With its large proportion of passenger travel, the Boston and Maine still stands in the front rank of safe operation. No railroad in the country has a better record, yet this is referred to with hesitancy. In the past seven years the Boston and Maine has operated over 70,000,000 passenger train miles without fatality to a passenger in a train accident.

It has set up for the protection of its trains a larger percentage of automatic block signals than all but four of the railroads in the country having more than 550 miles of track. Of its considerable mileage, 64.8 per cent is safeguarded by 2,564 automatic block signals. In addition, 2,794 manually controlled signals are operated.

Its punctuality of performance, like its safety of operation, ranks high. This "on-time" service was demonstrated recently when President Coolidge, transferring the Nation's summer capital over night from Washington to Swampscott, was brought to his rail destination at Salem by the Boston and Maine on the exact second of the hour set. It should be added that the President and Mrs. Coolidge, themselves also exemplars of New England punctuality, were no less prompt and were ready to step from their observation sleeping car the instant the big Pacific engine made its stop.

A Cross-Section of New England

A pioneer railroad in its beginnings almost a century ago, and a busy railroad, a safe railroad, a railroad of prompt service today, the Boston and Maine is still something more. In its relation since 1900 to the northeastern group of states which it serves, it has been a cross-section of much of New England.

Geographically, industrially, agriculturally and socially, in this quarter-century since the last of the consolidations which made it a system of systems, it has constituted a representative profile of Massachusetts, New Hampshire, Maine and Vermont.

Thus, instead of the "Boston and Maine Railroad," the "New England Railroad" might more properly be its

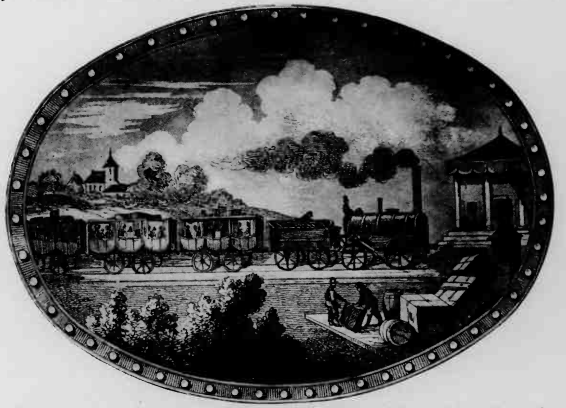
title. But the name "Boston and Maine" has long had, and now enjoys, much of this New England significance as a household word, and as an industrial token.

At the present time this pioneer railroad is again pioneering. With a "door to door" delivery system co-ordinating freight train and motor truck, understood to be the first inaugurated on modern lines by any railroad in the country; with the operation also of a co-ordinating motor coach and passenger train service, likewise under the Boston and Maine Transportation Company, its automotive auxiliary, it has extended its activities into new fields. Not entirely new, however, because the Boston and Maine for close to half a century has operated by an arrangement with freight express companies a system of door to door delivery between its Boston terminal and points within a radius of 50 to 75 miles.

This new "door to door" system of completed transportation is operating over the same Boston-Lowell route on which the original line of the system started nearly a century ago. It is operating also between Boston and Lawrence. As an indication of the railroad's constructive activities, it may be said here that Lawrence, one of the largest textile centers in the world, attained its greatest growth after the Boston and Maine had scrapped nine miles of track in 1848 to extend the railroad to that young mill town.

Helpful Always

The Boston and Maine and its constituent lines (there are 165 chartered railroad companies included in the present system, 111 of which actually built railroads) are properly said to have long functioned as helpful factors in New England's industrial, agricultural and social life. The picture



First Train Operated on Lines of Boston and Maine System—Boston & Lowell Railroad, June 24, 1835. Engine "Stephenson," with Stage-coach Type Cars

was first painted for the public nearly 75 years ago by the "Travellers' Railroad Guide," which in 1857, describing railroads leading out of Boston to points north and east which are now embraced in the present Boston and Maine system, said:

"Perhaps no people in this country or Europe have a more perfect system of railroading than Massachusetts, and though much of the capital invested in these corporations has not directly yielded the rewards anticipated, yet indirectly, the state has been enabled to surpass in growth of population and value of property most of her old sister states, and even to keep pace with the young and thriving West. Thus the villages have grown into towns, and the towns into cities, and along the web-work of rails there is almost a continuous city, of which Boston is made the head and the mart of trade."

The success of these early lines in New England must have lent inspiration to the Forbes, the Perkins, the Ames and other New England families, who were so largely responsible for the operating and financial development of the western railroads.

It is true today, however, as it was in the days of which the "Travellers' Railroad Guide" speaks, that "much of the capital invested in these corporations has not directly yielded the rewards anticipated."

The Boston and Maine as a system today represents an aggregate of $288,316,071, according to the valuation of the Interstate Commerce Commission, brought up to date as of December 31, 1923. This figure is comparable with a book investment figure on the same date of $262,315,354, and comparable also with a total net capitalization outstanding in the hands of the public of only $224,762,360.

It will be seen that with this spread between stock, book investment and valuation there can be no "water" in the Boston and Maine's capital structure. To complete this statement of values, it may be stated that protests filed by the railroad with the Commission, if granted in full, would increase the final valuation figures by approximately $100,000,000.

The Boston and Maine in its stockholder representation also constitutes a cross-section of the New England States. Of a total of 16,308 stockholders, 10,651 live in Massachusetts; 3,038 in New Hampshire; 673 in Maine; 183 in Vermont. Woman's interest in the Boston and Maine is considerable, an analysis of holdings on December 31, 1924, showing 7,094 women stockholders out of the total of 16,308.

Serves Five States and Canada

Geographically, the Boston and Maine system now comprises 2,403 miles of road, and 4,431 miles of track, including multiple track, yards and sidings, in five states and in Canada. A force of 27,735 employees was required to operate these lines last year.

In much of New Hampshire and in large sections of Massachusetts, Maine and Vermont, the Boston and Maine supplies the only rail transportation. It extends also into New York State to complete for New England, through its "Hudson River Gateways" at Mechanicville and Rotterdam Junction, several important through freight routes to and from the west. Connections are made at these points with the New York Central and the Delaware and Hudson in great yards ample to care for New England's business, and by way of the Province of Quebec and northern New England, it has pushed out lines to handle additional trunk line movement over the differential routes via the Canadian National and Canadian Pacific systems.

To the State of Maine, the lines of the Boston and Maine offer its only rail outlet to the rest of the country, except through Canada. At Springfield, Mass., paralleling and crossing the picturesque Connecticut Valley, and at Worcester, Mass., the Boston and Maine provides passenger and freight gateways to northern New England, and to Canada for through passenger trains from Washington, Philadelphia and New York.

JAMES H. HUSTIS
President, Boston and Maine Railroad, Since 1914

Between the Hudson River and the sea, the territory which must be traversed to reach Boston by direct routes from the west, the Boston and Maine line is approximately ten miles shorter than the line of any other road. As a result of the foresight of the fathers who cut through almost five miles of mountain to form the Hoosac Tunnel, in an enterprise which was the greatest of its kind in the world for years and still marks the longest tunnel in the country, the Boston and Maine crosses the 2,000-foot barrier of the Berkshires over relatively easy grades. Until the Hoosac Tunnel broke down this barrier, Boston had only one track to the west.

Popular for Scenic and Resort Travel

Still in the geographic relation, the Boston and Maine lines after leaving the centers of industry and population on the southeastern part of the system which have Boston as their focal point, run through typically picturesque New England scenes.

Lakes that lie between attractive countrysides, mountains that lift their summits to soar in cloud-wrapped solitude, seacoasts of rugged rocks or smoothest strand, and rivers that run gloriously on, are all close at hand or near by. The New England Coast, the White Mountains in New Hampshire, the Green Mountains in Vermont, the Berkshire Hills in Massachusetts, and the shores and lakes of

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Maine, are place-names known the country over.

These and other natural attractions with which New England is endowed bring thousands of persons to travel on the Boston and Maine, summer and winter. It has been one of the leading summer resort railroads of the country for generations, and nowadays the growth in winter sport activities is bringing it a new seasonal traffic, already large and increasing.

The close proximity of centers of industry and population in eastern Massachusetts presents an intensive field of service, together with an operating problem. A vast net-work of lines stretches over a sixty mile radius near Boston. By contrast with the open country on its northern routes, a heavy traffic density prevails in this area.

Owing to the closeness of large stations and yards, the number of train movements is extremely heavy. Switching service is extensive. The short average distance which passengers and freight are carried, with two handlings necessary for every passenger and ton moved, is a factor in operations and in cost. On some short runs, the cost of road haul is negligible as compared with the double terminal expense.

It is generally conceded that operation of New England railroads is considerably more expensive than that of carriers in other sections of the country. The snow hazard alone adds over a million dollars to operating expenses in some years.

These features are of special interest when considered in connection with the operating performance of the Boston and Maine, and the effectiveness with which it has handled New England's business in the past quarter century of the consolidated system.

Increased Service—Improved Efficiency

For the year ended June 30, 1902, its revenues amounted to $30,764,492 and for the year ended December 31, 1924, the revenues amounted to $78,-697,298. During that period the tons of revenue freight carried increased from 17,516,571 to 21,548,210, or about 23 per cent. and the freight ton miles increased from 1,538 millions to 2,744 millions, or 78 per cent.

To handle the freight traffic of 1901 required 7,424,741 freight train miles and 174,963 mixed train miles, while the freight traffic of 1924, which, as shown above, exceeded that of 1901 by 78 per cent., was handled by 5,728,232 freight train miles and 106,705 mixed train miles, a reduction of about 23 per cent. in freight train miles and a reduction of about 39 per cent. in mixed train miles. This situation is the result of the increase in the average train load which in 1901 was 202.4 tons. By 1914 the train load had increased to 314.4 tons, or 55 per cent. more than in 1901, and by 1924 the Boston and Maine train load had been increased to 472.4 tons or about 144 per cent. more than in 1901, and about 50 per cent. more than in 1914.

The peak freight traffic was in 1920, when the revenue ton miles amounted to 3,706 millions. Although a reduction in traffic is usually a handicap in the effort to increase the train load and thereby decrease the cost of freight train operation, the train load for 1924 was about 4 per cent. heavier than in 1920, with the volume of traffic showing a reduction of about 26 per cent.

The number of passengers carried in 1901 was about 38,500,000. By 1913 the number had increased to 49,900,000. In the next three years there was a reduction in the number of passengers carried so that in 1916 the figure was

down to about 42,500,000. In 1920 the number had mounted to a new high figure of about 54,900,000, but since that time the number has diminished.

Essential to Industry

It is in its contribution to New England's industrial welfare that the Boston and Maine has found its greatest field of usefulness. New England is a manufacturing section largely, except where agriculture, dairying and lumbering have retained their hold, and as such it is dependent on its transportation, and principally on its railroads, to carry its products to market and to bring its raw materials, its foodstuffs and its fuel.

In the territory comprising a little over 2 per cent. of the area of the United States, New England produces more than 11 per cent. of the total manufactures. It has had the longest experience in manufacturing of any section of the United States, but it also has the disadvantage of distance from sources and markets, which the railroad has overcome.

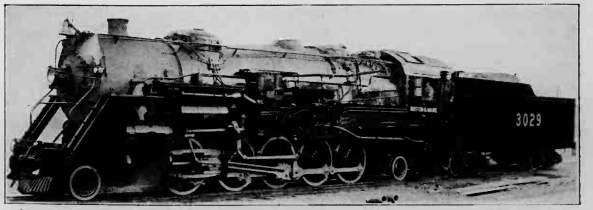
The great textile centers along the Merrimack River, Lowell, Lawrence and Manchester; the great shoe manufacturing centers of Lynn, Haverhill, Manchester and other industrial and commercial centers like Portland, Worcester, Springfield, Nashua, Fitchburg and North Adams, all must be maintained by raw materials brought from the south or the west. The Boston and Maine Railroad in the year 1924 brought into New England over 11,000 carloads of cotton originating in the southern and southwestern states.

New England's dominance of the wool manufacturing industry has made Boston the greatest wool market of the country. Of the total wool clip for the United States, Boston's receipts annually amount to from 70 to 80 per cent., of which the Boston and Maine Railroad's share runs to 10,000 carloads.

New England also leads all other sections of the United States as a shoe manufacturing district, and produces about fifty per cent. of the boots, shoes and slippers made in this country. It requires over 7,000 carloads of leather to supply the factories located on the lines of the Boston and Maine Railroad each year. New England manufactures more than two-thirds of the textile machinery produced in the country.

New England's fuel has to be moved over long distances, 5,003,962 tons of it by the Boston and Maine alone last year, which constituted 23.7 per cent. of the Boston and Maine's total revenue freight.

To reach their principal markets, New



One of Thirty Husky Santa Fe Engines Built for Boston and Maine Service on Berkshire and Fitchburg Divisions, Which Handle Forty-four Per Cent. of System Ton Miles

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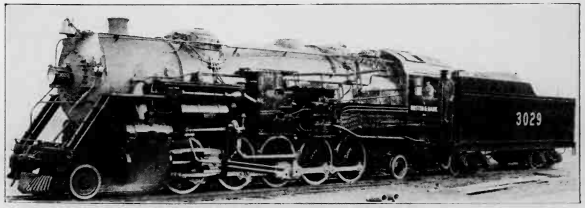


One of Thirty Husky Santa Fe Engines Built for Boston and Maine Service on Berkshire and Fitchburg Divisions, Which Handle Forty-four Per Cent. of System Ton Miles

England's finished products require transportation over long distances, and this the Boston and Maine supplies.

Combined with the element of service is the element of rates. As factors in transportation, they have a vital influence on the manufacturing and general prosperity of New England. The Boston and Maine's policy in its rate structure has been one of adjustment wherever possible to enable New England industries to market their products successfully in competition with other sections of the country, at the same time that reasonably adequate revenues are obtained for the railroad.

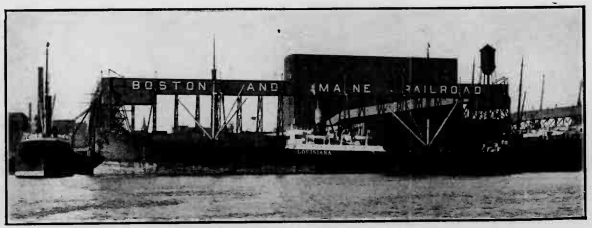
In New England and elsewhere throughout the country, the Boston and Maine has engaged in the business of promoting prosperity for its manufacturers. It maintains at Chicago, Detroit, Pittsburgh, Cleveland, Kansas City, Memphis and New York off-line agencies which make it their concern not only to solicit business for the Boston and Maine, but also to render all assistance possible to plants located on its lines.

These off-line agencies render valuable assistance to shippers and receivers of raw material, foodstuffs and products of the mines which are received from all parts of the country, and they also keep in touch with the movement into their territory of products from New England manufacturers, assisting in road movement when demands for car supply are pressing.

The Boston and Maine has been active in locating new industries along its lines, and within a few months has brought to East Somerville, Mass., on railroad land, a $4,000,000 assembly plant projected by the Ford Motor Company, which is expected to develop 25,000 carloads annually. It will involve the production of 500 automobiles per day, with employment for 2,500 persons at the outset. In the past three years 85 additional important industries have been brought to its lines in an effort to obtain new business and a greater diversity of manufactures.

Boston as a port is 173 miles nearer to Liverpool than is New York, and the Boston and Maine has endeavored to build up an export movement with this advantage of location, although handicapped by differentials. Boston Harbor's closeness to the open sea has been a further helpful factor.

The Boston and Maine has recently inaugurated a special campaign to increase foreign traffic through the Port of Boston, and has big water front properties in the Hoosac Tunnel Docks and at Mystic Wharf where such business is handled with accommodations



Steamships Loading Grain at Hoosac Docks

Great Potato Houses—Largest in World

for 14 ships. Grain elevator space is available at these terminals for 1,500,000 bushels, and 28 cars of grain can be spotted at one time. A coal discharging plant at Mystic Wharf comprises eight unloading towers.

Aid to Agriculture

Agriculturally, the Boston and Maine supplies a service in transporting products of New England farms which reaches large proportions, and in bringing to New England other products of agriculture to supplement her own, handles an aggregate of 2,915,009 tons a year under this classification. This movement is varied, but bulks largest in potatoes, most of which are carried seasonally from Bangor and Aroostook and Maine Central points to the biggest potato market in the world at Boston.

Dairying is akin to agriculture, and the movement of milk to market by the Boston and Maine involves a daily service of large volume. Only the New York Central, it is believed, carries more milk. Cars with refrigerating facilities and with messengers to expedite the movement, are provided, and in addition milk is handled in baggage cars from other points.

An average of 92 loaded milk cars are moved daily in six trains, operated exclusively in milk service. The movement into Boston alone aggregates more than 150,000,000 quarts a year. In one month recently a total of 25,489,274 quarts of milk and cream was handled over the system. The average haul

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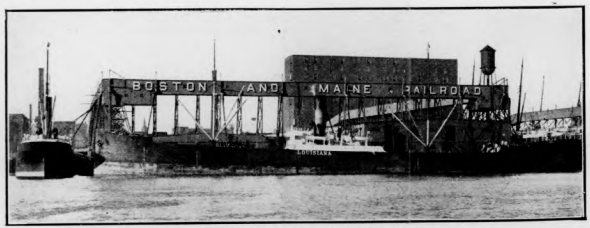

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was 191.7 miles, and the revenue, only .0092239, or less than one cent per quart, left little profit. Yet the volume was so great that it meant a gross revenue for one month of $172,181 to the railroad. This phase of operations also may well be considered in the light of its contribution to New England's social life.

Service to Society

This social aspect of the cross-section has many phases. The part which a railroad plays in maintaining a high standard of social and civic welfare is not always appreciated. The theory of commutation rates is not generally understood. It is essential to the physical health and to the quality of citizenship, of urban populations especially, that families be raised away from the congested centers of population. To do so, low rates for daily travel by rail between home and business are a requisite.

It is these commutation rates which have made possible the establishment of so many communities in suburban zones. The concessions in this respect by New England railroads are more liberal as to conditions than any form of multiple-ride transportation sold to suburban riders in New York, Philadelphia or Baltimore.

The Boston and Maine today handles three commutation passengers for every two who pay full fare. In 1924 its trains carried 40,000,000 passengers, of whom roughly 60 per cent. rode as commuters at reduced rates, requiring 40 per cent. of the passenger service, and contributing only 20 per cent. of the passenger revenue. When it is appreciated that revenues from riders on the Boston and Maine in 1924, which was a fairly typical year, were $21,309,338, out of total operating revenues of $78,697,298, or 27 per cent., the effect of these proportions will be better realized.

Any railroad holds a large place in the social life of its traveling public. The Boston and Maine has patrons who have been riding its trains daily for decade after decade. The dean of its commuters, probably, is E. S. Thayer, of Topsfield, now 88 years old, and for the past 71 years a rider between his home town and Boston. The Newburyport Railroad began operations in 1854, and in the same year Mr. Thayer made his first trip to Boston. He still goes to his office via the Boston and Maine.

There are scores of other commutation patrons whose records as riders surpass, or closely approach, the half century mark. Among those are W. R. Marr, a Boston business man living in Gloucester, who has been a passenger on the trains of the Gloucester Branch during the 47 years that they have been in operation.

The rates which a railroad charges for the transportation of food commodities may properly be considered in a social sense. Too often railroad rates are held responsible for tending to increase living costs.

A study of conditions by Professor R. J. McFall of the Massachusetts Agricultural College, reported to the American Statistical Society recently, showed that increased retail costs for food in Massachusetts appear almost entirely after the food is in the hands of the local distributors, a fact which he said "discounts the importance of transportation costs. . . . The chief cause for these higher prices," he added, "lies somewhere in the local marketing systems."

Notwithstanding Massachusetts' distance from the country's major sources of food production, and the charges for moving food into the markets of the state, which he gave as the causes most commonly assigned for higher retail costs, Professor McFall "estimated that the food costs at wholesale were only 1.29 per cent. more in Massachusetts than in a selected group of cities elsewhere in the country."

"This fact," he explained, "may seem surprising until we consider that freight costs are small as compared with the final wholesale price of food in our cities. Freight on meat shipped to Boston from Chicago is only 87 cents per cwt. On flour it is only 45.5 cents. On meat the freight rate from Chicago to Massachusetts points is exactly the same as to New York, and only one-fiftieth of a cent a pound more than to Philadelphia."

This sketch of some of the features of interest geographically, industrially, agriculturally and socially in the cross-section of New England as presented by the Boston and Maine, is necessarily one of high spots. The details of the railroad's day to day service in transportation would fill a book. The annual report of the Boston and Maine, long considered the most complete issued by any railroad in the United States, can only suggest these details.

Contributions to Art of Railroading

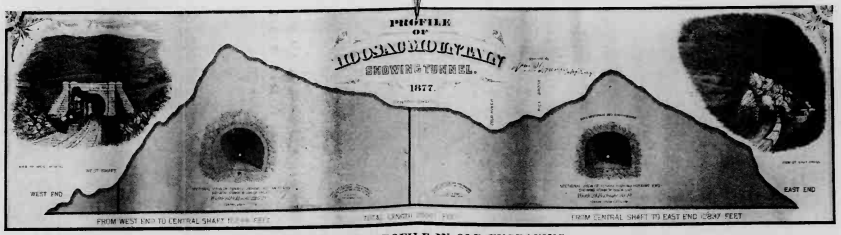
In its contributions to the art of railroading, the Boston and Maine can submit a number of incidents which have had a part in the development of the country's railroad service.

The first railroad tunnel of any size in America was the Hoosac Tunnel. In its construction, air drills and nitroglycerin were first used here.

The first successful interlocking switch in the United States was completed in 1881, at Lowell, by the Boston & Lowell Railroad (Boston and Maine).

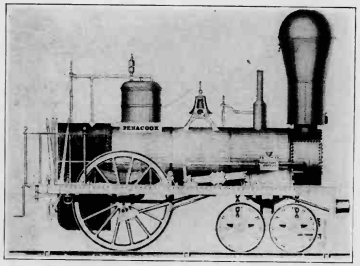
The Mount Washington Railway, used for tourist purposes since 1868, was the first in the world to use the rack-rail for steep mountain climbing. A vertical boiler made its first appearance there.

The vertical hook coupler,



HOOSAC TUNNEL PROFILE IN OLD ENGRAVING

Longest Railway Tunnel in United States. Through It Boston and Maine Handles Some of New England's Heaviest Hauls, Using Electric Locomotives. Begun in 1851, completed in 1875; electrified in 1910; 4¾ Miles long; Cost $18,000,000; One of Country's Outstanding Railroad Engineering Achievements.



Old Wood Burner "Penacook." The Fourth to Be Built by Hinkley & Drury. Sold to Concord Railroad, 1842. Hauled First Passenger Train Into Concord, N. H.

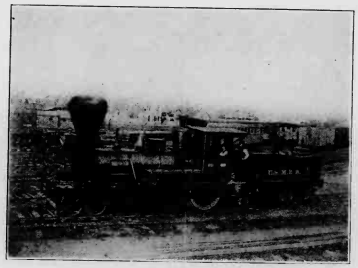
The first trans-continental shipment was started over the Eastern Railroad (Boston and Maine) from Portland, Me., September 14, 1883, for Portland, Ore.

The Boston and Maine was a pioneer in the use of machines in freight accounting work, and was one of the first roads to adopt through waybilling of freight.

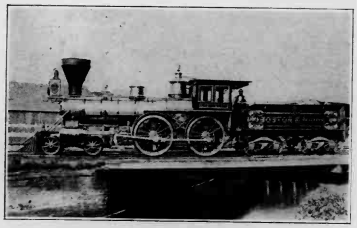
McLoughlin's flexible steel joint was invented by M. L. McLoughlin, a Boston and Maine foreman, and first used on this road.

The Concord shop of the Boston and Maine was one of the earliest shops having electric distribution of power from a single power plant.

The split switch is a development of a device of which the A. R. A. coupler is a development, was devised by Watchman Mitchell of the Boston, Concord and Montreal Railroad (Boston and Maine) at Lancaster, N. H., and with subsequent improvements is widely known as the United States Coupler today.



Famous Locomotive "Dover." Built by the Boston and Maine, 1848; transferred to the Government (U. S. Military R. R.) in '62. Photograph Taken in Civil War Service at Alexandria, Virginia.



The "General Grant," Passenger Engine, Built For Boston and Maine at Close of Civil War. Brass Trimmings, Red Painted Driving Wheels, Gold Leaf and Scrolls Marked This Locomotive and the "General Sherman," Product of a Rival Shop.

first used at Bethlehem Junction, N. H., in 1882.

Locomotive Development

An exhibit of the motive units used on the Boston and Maine in the past ninety years would comprise an interesting picture of the development of locomotion. It would begin with the famous old "Stephenson" of the thirties, and would include the various series of wood burning locomotives, and the succeeding coal burners up to the big Santa Fe, Mallet and Pacific locomotives now used in freight and passenger service.

With this exhibit would be included the oil burning engines used in the Hoosac Tunnel prior to 1910, and the big 130-ton, single phase, 11,000 volt electric locomotives which have been operating there ever since that time.

The exhibit would also include the self-contained steam car, which the Boston and Maine used for experiment and service several years ago; the gasoline rail units, both single car and in trains which have been in service during the past year, together with the motor coaches and motor trucks now being operated by the Boston and Maine Transportation Company.

Accomplishments of Construction

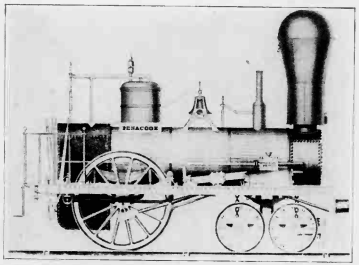
As it stands today, the Boston and Maine system represents many triumphs of engineering accomplishment by the railroad builders. With New England's varied topography of rivers and their water-sheds, a bold shore front or occasional stretches of softer marshland, and the hills and mountains which form the background for its attractive countrysides, it has offered problems which were surmounted in a manner to attract world attention.

The construction of the Hoosac Tunnel, breaking down the barrier of the Berkshires by a double-track passage bored 4¾ miles through two mica-slate peaks of the Hoosac Mountain—in a project which took 23 years to complete and proved as much of a human and financial task as it was a physiographic problem—costing 105 lives and 18,000,000, was a notable instance. Its story from the conception as a canal route in 1819 to connect the Hudson and Connecticut River Valleys, through its actual beginning in 1851, and its completion in 1875 as a railroad tunnel which opened up New England anew, caused the "Hoosac Tunnel Route" to take a distinctive place in American railroading.

Many long stretches of the several railroads entering Boston which are now comprised in the Boston and Maine, were originally built across marshes on pile trestles and filled in. The most notable instance of such water construction is the Boston terminal (North Station and its yards), which, by comparison with a plan made in 1818, is shown to have been virtually all under water at that time as part of Charles River Bay.

This terminal area of the Boston and Maine includes 65 acres on bridges and piling. Originally the terminal of four railroads, it offers an operating problem which at the present time is the subject of intensive study under plans for simplification and improvement.

The North Station layout, with a daily movement of 1,110 trains, drafts or light engines, including 387 passenger trains with 2,100 cars, has been termed one of the busiest, the most intricate and one of the most difficult operating stretches on the railroads of the United States. With its 23 tracks in the station proper and its terminal yards sprawled out beyond, as shown in the airplane view (next page), 1,600 movements have been made in one



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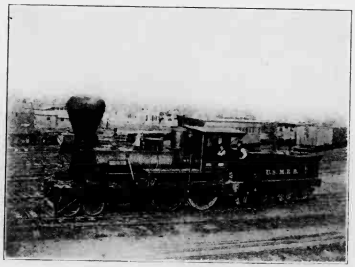

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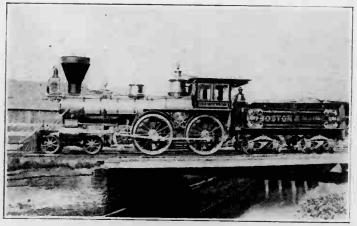

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Airplane View, Showing Extensive Boston Terminals and North Station Approaches; Over Three Rivers and Old Middlesex Canal; an Example of Early Railroad difficulties and Present-day Problems

twenty-four hour period through the bottle-neck of eight tracks which joins them.

In many places within the narrow confines of New England elevations of from 1,000 to 1,250 feet above sea level are reached in crossing watersheds. Heavy rock excavation had a large part in early construction, practically all of which had to be done by hand drilling and blasting by powder. In many of the old rock cuts the sides are nearly vertical, instead of being sloped away from the track.

There are more than thirteen hundred bridges on the system, or one for every two miles of road.

Its History

The interest of the student of railroads and of men turns strongly to origins, and in this respect the story of the Boston and Maine includes much that holds a place in the history of railroads in the country.

In all, the Boston and Maine has been said to comprise 165 chartered railroad corporations, of which 111 actually built lines. Eighty-two of these constructing companies are now owned by the Boston and Maine Railroad; twenty-one are held under lease and eight additional corporations which built roads are controlled, without ownership or lease.

Something of the story of railroad planning and projecting in the competitive era in New England and elsewhere half a century ago, with its chapters of high hopes, great ambitions and struggle for territorial control, is indicated by the fact that fifty-four additional corporations were chartered to build lines on those parts of the Boston

and Maine system which are now owned, leased or controlled, but failed to do so. Some of these charters, it should be said, were merely formal changes of names.

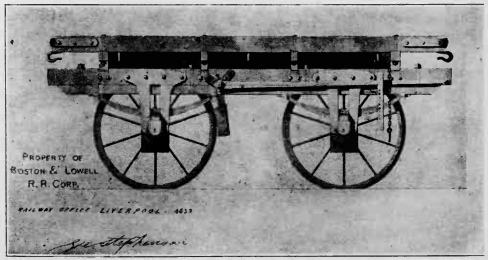
There is pedigree of railroads as of men; and the family tree includes the strong as it includes the weak. The Boston and Maine in its development has taken into ownership or control to increase its field of usefulness, scores of other lines. Some of these are roads which were the products of the era referred to, and the products also more nearly of competition, of strategy or of speculation for sale than instruments of service to the communities through which they passed.

Under conditions of increased operating costs, wage standardization and falling revenues, the burden of these weaker branches and their losing operations became pronounced, and from time to time they have been made the subject of petitions for discontinuance, in the interest of the railroad and of the public alike. At the present time several such petitions are pending, the effect of which, if granted, will be to make the Boston and Maine a stronger road.

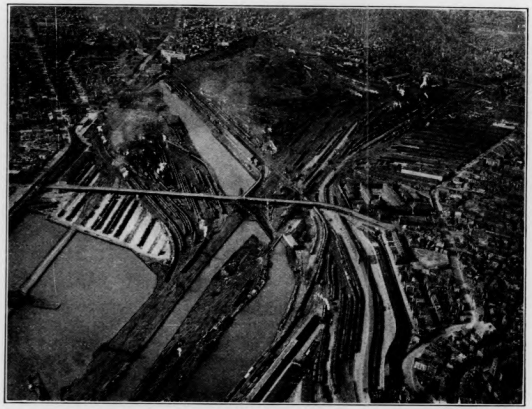
Going back to origins, it has been brought out that the Boston and Maine as a name sprang from the Andover and Wilmington Railroad Corporation, chartered on March 15, 1833, and opened on July 8, 1836. To the little group of men who fathered this project, building better than they knew, and who had the vision to extend their road, first to Haverhill in Massachusetts, then to the New Hampshire line, and thence into Maine with the wider field of a northern New England system in mind, belongs much of the credit for the system of today. Their spirit seems to have run through the Boston and Maine's efforts to extend its scope of service.

Boston and Lowell—1830

As the first of the lines to operate, however, the Boston and Lowell, in its early days contained many pioneer details of interest. In 1829 a committee of men interested in the cotton mills of Lowell, William A. Appleton, Patrick T. Jackson and Kirk Boott, petitioned the legislature to construct a railroad



Drawing of Rail Wagon by George Stephenson, Inventor of the Original Locomotive "Rocket," Sent from England to Boston and Lowell Railroad, Whose First Locomotive He Made. (Note Signature and Date 1832.)



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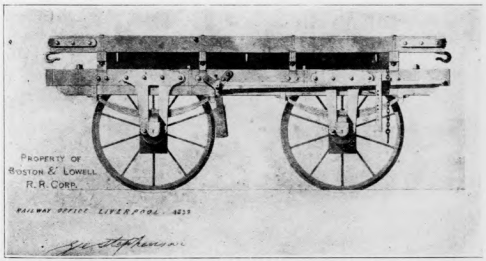

Drawing of Rail Wagon by George Stephenson, Inventor of the Original Locomotive "Rocket," Sent from England to Boston and Lowell Railroad, Whose First Locomotive He Made. (Note Signature and Date 1832.)

between that City and Boston. They sought to improve transportation facilities for their growing textile industry, and through the interest of Daniel Webster, the statesman, they obtained a charter on June 5, 1830.

Lowell, twenty-six miles from Boston, was just developing as a mill center. Transportation between the cities was dependent upon the Middlesex Canal and stage coaches. The canal, winding its way 27½ miles through Middlesex County from the present site of the North Station in Boston to Lowell, was inadequate. It was useless in the ice of winter.

It took two days to make a round trip between Lowell and Boston by stage coaches. It required eighteen hours for freight to pass from Boston to Lowell by canal, and twelve hours for the trip back, while passenger boats travelled in the faster time of twelve and eight hours respectively. Boston and Maine express trains today make this run in thirty-nine minutes.

In estimating the probable success of this enterprise, the committee decided that they would be able to care for the traffic for years to come if they provided three engines and about twenty cars. Contrast this with the fact that the present value of the fixed property actually used by the Boston and Maine in its passenger service between Lowell and Boston is $11,400,000, with an additional $4,700,000 representing the value of equipment required for passenger service exclusively. On this line, its property outside of the locations which are exempt from taxation is in excess of $35,000,000. On this property between Lowell and Boston the Boston and Maine pays annually to cities and towns along the 26-mile line taxes amounting to $957,000.

With the receipt of its charter the Boston and Lowell began construction at once. What sort of propelling power to use, however, was undecided. Horses drawing the cars, or working in them as a tread-mill; or even sails, which were the subject of experiments made on the Baltimore and Ohio and South Carolina Railroads in 1830, were considered. With horses as the motive power, it was felt that small numbers of passengers could hire cars and move along the railroad at will, on the old idea of a turnpike.

In fact, on October 5, 1831, Agent Jackson found it necessary to ask his directors to decide, "Do we determine to use Loco-Motive-Engines? and if so, will it be necessary to finish the center of the road for a horse path?" But the successful experiments of George Stephenson with his steam locomotive, "The Rocket," which had made a speed of 30 miles an hour with a loaded carriage attached, soon decided the question; and the horse path idea was abandoned.

The Boston and Lowell directors opened negotiations with Stephenson, and as a result many English ideas were adopted, such as avoidance of highway grade crossings, the use of stone ties and bearing blocks, and the fish-belly rail. The advice regarding grade crossings was valuable and the road, when completed, had only three crossings at grade between Cambridge and Lowell.

The advice about track construction was less fortunate. The stone ties and blocks, with cast iron chairs, were found to be destructive to tracks and equipment, and although continued in use to some extent until about 1862, were gradually replaced by wood.

The old fish-belly rail, so-called because of its resemblance to the side of a fish, was also inferior and iron straps laid over stringers of pine were used before "T" rails were finally adopted.

The Boston and Lowell track construction differed from that used on other American railroads. Two trenches, about three feet deep and five feet apart, were filled with small stones or gravel. The stone joint ties and the intermediate bearing blocks were placed on these and brought to grade. Large cast iron chairs were then placed on the latter and secured by wooden plugs and iron spikes which were driven into holes in the stone. The rails rested on the iron chairs and were held by tapering iron wedges or keys driven between the upper lug of the chairs and a slight flange on the base of the rail.

Stone Sleepers Used in Original Construction of Boston and Lowell Railroad—1832.

The building of the road, with the grading all done by ox-teams and hand labor, the blasting by hand drills and common powder, took nearly four years, and it was June 24, 1835, before the rails were used for the first time. That was a great occasion.

The engine, called "Stephenson," after its builder, constructed at Newcastle-on-Tyne, England, in 1834, had been shipped to Boston, taken apart there and loaded on a canal boat, being brought to Lowell by the old Middlesex canal, which it was soon to supplant. The first run of twenty-six miles to Boston was made in the then astounding time of one hour and seventeen minutes, and the return trip, with twenty-four passengers aboard, in one hour and twenty minutes.

The "Stephenson" had four large wheels. The boiler was enclosed in wooden lagging and was painted a vivid green with black bands and stripes. The engineer and fireman were without cab or other protection, as they were for many years.

The cars were built like stage coaches, seating six persons. The conductor, a man of distinction in those days with the title of Captain, also rode on the outside without shelter.

At first the railroad management cared little for local business. The only stop made between Lowell and Boston was for wood and water at the Woburn station, now called Walnut Hill.

Agent Jackson, on January 14, 1836, told his directors "we are requested to stop at six places, and I think it will require five minutes for each stop. If we add twenty or thirty minutes to the time that it now takes our regular train to go between Boston and Lowell, my opinion is that it would injure the repu-

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tation of our road for speed. . . . But I would try the experiment. . . .

"Which being read and considered, it was Voted that the agent be requested to make preparations for placing an extra engine and car upon the road for the accommodation of way passengers."

The year the Lowell Railroad went into operation the revenue of the canal was reduced one-third, and when the Nashua and Lowell Railroad five years later began rail operations to the north, paralleling the steamboats' extension of canal operations by way of the Merrimack River, the canal revenues were further reduced another one-third. The canal did not long survive. It may still be seen adjacent to the tracks at North Woburn, and at other points.

Dickens on American Railroads

Before leaving the subject of the Boston and Lowell section of the Boston and Maine system, it is of interest to note that Charles Dickens, after visiting the United States in 1842, wrote in his American Notes that he "made acquaintance with American Railroads on this occasion for the first time." His description of the ride from Boston to Lowell should be made part of the railroad history of the country.

"There are no first and second class carriages as with us; but there is a gentleman's car and a ladies' car; the main distinction between which is that in the first, everybody smokes; and in the second, nobody does. . . . In the ladies' car there are a great many gentlemen who have ladies with them. There are also a great many ladies who have nobody with them; for any lady may travel alone, from one end of the United States to the other, and be certain of the most courteous and considerate treatment everywhere. . . . If a lady takes a fancy to any male passenger's seat, the gentleman who accompanies her gives him notice of the fact, and he immediately vacates it with great politeness.

"Except when a branch road joins the main one, there is seldom more than one track of rails; so that the road is very narrow, and the view, where there is a deep cutting, by no means extensive.

"The train calls at stations in the woods, where the wild impossibility of anybody having the smallest reason to get out is only to be equalled by the apparently desperate hopelessness of there being anybody to get in. It rushes across the turnpike road, where there is no gate, no policeman, no signal—nothing but a rough wooden arch, on which is painted, '*When the Bell Rings, Look Out for the Locomotive.*'

"On it whirls headlong, dives through the woods again, emerges in the light, clatters over frail arches, rumbles upon the heavy ground, shoots beneath a wooden bridge which intercepts the light for a second like a wink, suddenly awakens all the slumbering echoes in the main street of a large town, and dashes on haphazard, pell-mell, neck or nothing, down the middle of the road.

"On, on, on—tears the mad dragon of an engine with its train of cars; scattering in all directions a shower of burning sparks from its wood fire; screeching, hissing, yelling, panting, until at last the thirsty monster stops beneath a covered way to drink, the people cluster round, and you have time to breathe again."

A Branch Which Became a System

While the pioneer Boston and Lowell Railroad was being completed, Hobart Clark of Andover, Mass., went to Utica in 1832 and rode on the Albany and Schenectady Railroad, then the only railroad in operation west of the Hudson River. Convinced that a railroad

to his home town of Andover would be a public benefit, he discussed the subject with neighbors on his return, and at a meeting in Locke's Hotel it was resolved to petition for a charter.

As a result, the Andover and Wilmington Railroad Corporation was incorporated on March 15, 1833, and this branch line from the Wilmington Station of the Boston and Lowell to Andover, a distance of about seven miles, was opened July 8, 1836. From this modest beginning a system grew. This was the child which fathered the man.

The directors soon decided to extend, and on April 7, 1835, they were authorized to build to Haverhill, and two years later to the New Hampshire line. These projects were completed under the name of the Andover and Haverhill Railroad Corporation, and this railroad was later merged with the Boston and Portland Railroad Corporation, a New Hampshire line, and the name Boston and Maine was adopted.

The line so extended into New Hampshire was gradually pushed on, reaching Exeter, N. H., in 1840, and South Berwick Junction, Me. (now Agamenticus) station in 1843, which remained the eastern terminus of the line, until extension to Portland was completed in 1873. The Boston and Maine, however, had been able to maintain a Boston to Portland service for many years prior to that time, by running over the tracks of the Boston and Lowell between Boston and Wilmington, and by way of the Portland, Saco and Portsmouth Railroad, as a joint facility with the Eastern Railroad, between South Berwick Junction and Portland.

Dissatisfied with the status as a mere branch of the Boston and Lowell, however, the directors of the Boston and Maine in 1844 sought and obtained authority to extend their line to Boston. The Boston and Lowell people opposed the move strenuously, and the eloquence of Daniel Webster and of Rufus Choate was invoked in the effort to stop the Boston and Maine extension.

A provision in the Boston and Lowell charter that no railroad should build within five miles of the Boston and Lowell tracks on a parallel route for thirty years was advanced, but the Boston and Maine's contention that the V relation between the two roads in the approach to Wilmington Junction did not constitute a parallel route was apparently accepted by the legislature. With the authority granted, the Boston and Maine built through to Boston, erecting as its terminal in Haymarket Square, the largest railroad station in the city, and one of the finest in the country.

A keen rivalry thus developed between the Boston and Maine and Boston and Lowell, which was ended only when the Boston and Maine took the latter road under lease in 1887. This line and its branches now constitute the Southern Division. Prior to the lease, the Boston and Lowell had arranged a through line to Montreal, but the Supreme Court of New Hampshire refused to ratify essential agreements with other roads. Today the Boston and Maine has three through routes to Montreal by connection with other roads.

Eastern Railroad—1836

Another important factor in the development of the Boston and Maine system was the Eastern Railroad, now a part of the Portland Division. This was incorporated in 1836, and opened from East Boston to Salem in 1838, with a ferry service to Boston proper. It was opened to Newburyport in 1840, and later became a serious rival of the

Boston and Maine by extending to Portsmouth. It went into Portland over the tracks of the Portland, Saco and Portsmouth Railroad in 1842. The extension from Revere to Causeway Street, Boston, obviating the former terminal ferry service across the harbor from East Boston, was opened in 1854, the Eastern thus obtaining extensive Boston terminal facilities.

From 1850 to 1880 rivalry between the Eastern and the Boston and Maine was keen. Attempts to divert traffic from the Boston and Maine were frequent and this led to the building of the Saugus Branch Railroad in 1853, the South Reading Branch in 1850, and the Newburyport Branch in 1854. All but the last named line soon passed into control of the Eastern and that company took retaliatory steps which made necessary the Boston and Maine Extension to Portland.

In 1844 the Eastern was leased by the Boston and Maine, and it was merged in 1890. For years the Boston and Maine had been handicapped by lack of terminal facilities at Boston, but with the lease of the Eastern the Boston station and extensive Charlestown Terminals became available.

The Eastern Railroad's "Instructions for Conductors and Enginemen while passing over the road," issued about 1838, are of interest today. They show that railroading in the old days included work on horse-back. Conductors were directed to see that "when anything shall happen to a train to render assistance necessary, a brakeman be dispatched on horseback."

The "Master of Depot" was instructed, "If at any time a train should not arrive at either depot, in one hour from the time of its starting from the other, the Master of Depot will immediately start on horseback to learn the cause of the delay."

Fitchburg Railroad—1839

The last of the principal steps by which the Boston and Maine system was developed as an operating entity brought the Fitchburg Railroad into the fold by lease in 1900. The Fitchburg brought to the Boston and Maine a through line to New York State, including the Hoosac Tunnel, which it had acquired in 1887.

This group had its beginning in 1839 when the Charlestown Branch Railroad was opened from Fresh Pond in Cambridge to the Tudor Wharves in Charlestown, designed mainly for transportation of ice to ships for export to Calcutta and the West Indies.

The Fitchburg Railroad Company itself was incorporated March 3, 1842, and the line from Boston to Fitchburg was opened in 1845. A year later the Charlestown branch was bought. In 1848, the great stone station on Causeway Street was opened as its Boston Terminal, and when the lease was signed the Fitchburg yards in Charlestown and the Fitchburg station were added to the Boston and Maine terminal properties, units of the fourth railroad to be included in the Boston and Maine terminal group.

For a period of seven years the Fitchburg Railroad operated a branch line to Harvard College for passengers. This was discontinued in 1856, and the fact has almost been lost to memory.

In any history of the Fitchburg Railroad there should be included details of the Hoosac Tunnel project, its financial and physical problems, including the fact that the State of Massachusetts had to step in to the rescue when the Troy and Greenfield Railroad, which had undertaken it, was forced to give up the task. The fact that a very considerable proportion of all the tonnage handled by the Boston and Maine passes through this bore is an indication of the

usefulness of its service to New England.

That chapter of the Boston and Maine developments which deals with the Concord and Montreal Railroad should be coupled with the Boston and Lowell, of which system it formed a part.

In recounting the scores of other lines which have entered into the making of the Boston and Maine Railroad of today, one would need to give far more detail than is possible in the scope of this article. It should be said here that much credit goes to the men who sponsored these early lines, at the same time that it may be frankly stated that a number of these lines proved a burden almost from their earliest days.

The Boston and Maine has been in the hands of interests outside of New England only once in its career, when for a short time A. A. McLeod and the Philadelphia and Reading Railroad obtained control of its stock. The control later obtained and lost by the New York, New Haven & Hartford Railroad under the Presidency of Charles S. Mellen, is a matter of recent history, together with the fact that in the reorganization of 1919 the status of a number of lines previously held under lease became one of complete consolidation with the property.

The Human Element

There is a human side to the Boston and Maine of which little is heard and the extent of which is not indicated by the number of 27,735 employees. Loyalty to a service, and devotion to an art —in this case the service of transportation for New England, and the art of railroading for the Boston and Maine, cannot be measured in numbers.

Through the operating, the traffic, the accounting, and other departments in the past decade especially there has run a spirit of service, reflecting the inspiration that has come from the President and his executive organization of Vice-Presidents and other department heads. This spirit has been carried along through the general superintendents and the divisional superintendents, and beyond them to train crews, station, yard, track and shop forces, and extended similarly in other departments.

This human side of the Boston and Maine, if space were available for the telling, should receive quite as much attention as the study of operations in the broader terms of history, geography, industry, agriculture and society. It would include reference to many men with service records of half a century or more—and to families in which father and son, and their grandfathers before them, were Boston and Maine men.

The keynote of the relationship between the Management of the Boston and Maine, and its employees generally, was summarized in the same annual report for 1924 to which previous reference has been made, as " a service distinguished by voluntary interest and good will rather than a mere perfunctory discharge of assigned duties."

This statement may be said also to summarize fairly the relationship between the Boston and Maine Railroad and the public of New England which it seeks to serve.

BOSTON AND MAINE RAILROAD

E. L. Grimes Printing Company
Boston, Mass.

END OF
TITLE